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# MEDICAL NEWS LETTER

Editor - Captain L. B. Marshall, MC, USN (RET)

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### Graduate Training in Navy Hospitals

1 Applications for assignment to residency training duty are desired from Regular medical officers and those Reserve medical officers who have completed their obligated service under the Universal Military Training and Service Act, as amended. The chart below lists those Navy hospitals which currently have vacancies at the first year level, and the specialties in which these vacancies exist. Vacancies are also available at other than first year levels. Information concerning non-first year appointments may be obtained by correspondence addressed to the Chief of the Bureau of Medicine and Surgery.

2 Applications for the below first year level appointments will be accepted from now until 30 January 1956.

3 A limited number of vacancies in General Surgery are now available to qualified Reserve officers.

4 Letters of application for first year assignments should be forwarded via official channels to the Chief of the Bureau of Medicine and Surgery, and should include an obligated service agreement prepared in accordance with the provisions of BuMed Instruction 1520. 7.

	Bethesda, Md.	Chelsea, Mass.	Oakland, Calif.	Philadelphia, Pa.	Portsmouth, Va.	San Diego, Calif.	St. Albans, N. Y.
Anesthesia	x	x	x				
General Practice		x		x			
Internal Medicine		x		x			x
Neurology	x			x			
Orthopedics	x	x		x			
Otolaryngology	x			x		x	
Pathology	x		x				x
Pediatrics			x				
Psychiatry	x		x	x			
Radiology	x	x		x		x	
Surgery				x	x	x	
Urology							x
Cardio-Vascular Diseases	x						



SPECIAL NOTICE

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Failure to reply to the address given on the form by 15 December 1955 will automatically cause your name to be removed from the files. Only one (1) answer is necessary. Please state the branch of the Armed Forces (if any) and whether Regular, Reserve, or Retired. Also, please write legibly. If names and addresses cannot be deciphered, it is impossible to compare them with the addressograph plates.

Editor

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(Detach here)

Chief, Bureau of Medicine and Surgery \_\_\_\_\_  
Navy Department, Potomac Annex \_\_\_\_\_  
Washington 25, D. C.

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### Policy

The U. S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be nor susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

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### Notice

Due to the critical shortage of medical officers, the Chief, Bureau of Medicine and Surgery, has recommended, and the Chief of Naval Personnel has concurred, that Reserve medical officers now on active duty who desire to submit requests for extension of their active duty for a period of three months or more will be given favorable consideration.

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### Lymph Node Smears in the Diagnosis of Lymphadenopathy

Excision of a lymph node has for many years been the final arbiter in the diagnosis of lymphadenopathy. This often leads to considerable expense and delay in treatment because general anesthesia and admission to hospital may be necessary apart from the time taken to fix and stain sections. The importance of establishing a diagnosis before treatment has led to increasing use of aspiration and punch biopsies by a variety of different techniques. All of these methods have advantages of ease and speed of application over excision of a node; several nodes can be examined and, in case of doubt, further specimens are easily obtainable. It must be allowed that section of the small amount of tissue obtainable is inferior to section of a whole node, although many authors prefer this method to examination of smears. It cannot be emphasized too strongly that analysis of smears is more easily undertaken by those trained in examination of the similar smears from bone marrow than by those most experienced in the histology of lymph nodes. By the smear method, the paucity of tissue



obtained and its detachment from its surroundings are of little importance; cytologic abnormalities are usually generalized by the time a node is large enough to puncture; a simple needle and syringe is adequate, and preparation of specimens is quicker. It has been suggested that detectable cytologic abnormalities preceded histologic change. The accuracy of these methods must be viewed against the accuracy of excision but failure can always be followed by excision of a node as suggested by Martin and Ellis and Stewart. Aspiration biopsy has been condemned on the ground that it disseminates disease but there is little evidence that this danger is greater than after excision.

This article describes the cytology of lymph nodes in health and disease, based on 15 normal and 85 pathologic nodes, and assesses the diagnostic value of lymph node aspiration biopsy on 85 consecutive successful aspirations.

Survey of this series suggests that the cytology of malignant disease and of some cases of reticulosis is sufficiently characteristic for diagnosis. It remains to be seen whether any classification can be made from smears which would be of clinical value for diagnosis or prognosis, and whether it would throw any light on the nature of the underlying disease. The classification of Pavlovsky has achieved most popularity but the author has found it of limited value. Strunge's classification is too cumbersome for ordinary clinical practice. Stuyt's conclusions are more helpful and the author's results confirm his statement that diagnosis is made on abnormal cells rather than on the relative frequency of normal cells. The time thus saved on differential counts is much better spent on a careful examination of smears under the one-sixth objective of the microscope; most abnormal cells are large and easily seen at this magnification.

Ninety-five percent of the cells of normal nodes are lymphocytes. The most primitive cell is the multipotent hemohistioblast which gives rise to the histiocyte and the hemocytoblast, the parent of three differentiated 'blast cells, the lymphoblast, monoblast, and plasmoblast. 'Blast cells are rare in normal nodes but can be observed in inflammation.

The cytology of 85 pathologic nodes is described, the final diagnoses being confirmed histologically in most instances.

The features of inflammation are similar, regardless of the cause. Some types of inflammation result in excess of one series of cells more than another; it is rarely possible to distinguish them on these grounds but the cytology may indicate those cases in which search for tubercle bacilli is likely to be rewarding.

Sternberg cells and their precursors are almost specific for Hodgkin's disease. Diagnosis is possible if they are present together with a pleomorphic cytology.

A diagnosis of leukosis or primary or secondary neoplasm can be made if 80% of the cells are abnormal. Distinction of these three groups



from smears depends on the type and distribution of cells. The degree of abnormality bears no relation to prognosis. Diagnosis depends on finding abnormal cells; differential counts are of little value.

Analysis of the few cases of reticulosis examined suggest that cytologic classification is unlikely to be useful.

Examination of one smear from each of 85 nodes for 15 minutes without clinical information enabled a diagnosis to be made in 52 cases; the only error was that monocytic leukosis was called reticulosarcoma. On two occasions, one of secondary carcinoma and one of reticulosis, the correct diagnosis was made from smears at a time when histology showed non-specific changes only.

The method should find a useful place as a screening test in diagnosis of lymphadenopathy, excision of a node being carried out if aspiration fails or if the diagnosis cannot be made from smears. (Lucas, P.F., Lymph Node Smears in the Diagnosis of Lymphadenopathy: A Review - Blood, X: 1030-1051, October 1955)

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### Polyarteritis Nodosa

In recent years there has been an increasing interest in a group of conditions known as the collagen diseases. Polyarteritis nodosa, disseminated lupus erythematosus, scleroderma, and dermatomyositis, as well as rheumatic fever and rheumatoid arthritis, are the major ones usually considered in this category. Although their pathogenesis remains obscure, they have in common a disturbance in connective tissue collagen fibrils. This gives rise to clinical features that are very similar, and in some instances it may not be possible to differentiate clearly one from the other clinically and occasionally even pathologically.

Polyarteritis nodosa is being diagnosed clinically more often in the past few years with the aid of the muscle biopsy, but its recognition has not kept pace with that of disseminated lupus erythematosus, probably because it occurs less commonly.

The etiology of polyarteritis nodosa is not established. There is evidence, both clinical and experimental, suggesting that hypersensitivity or allergy is a related or causative factor.

Polyarteritis nodosa is an inflammatory, obliterative, vascular disease involving medium and small sized arteries. The vessels of the heart, kidney, brain, lungs, gastrointestinal tract, pancreas, muscle and, actually, all tissues with a vascular supply may be affected. The pathologic changes are usually patchy and may be confined to a portion of the circumference of the artery but more often they involve the entire wall of the vessel.

The lesions are most frequently widespread but there have been cases in which only a single organ or vessel has been involved.

Clinically, the symptoms and signs are as variable as the pathology. The symptomatology is related to and depends upon the tissues involved and is characterized by remissions and exacerbations with one or two organ systems affected most prominently at a given time. It may develop at any age but the greatest incidence is in the young adult.

There are nonspecific symptoms that occur regardless of the location of the diseased vessels. Fever is a common manifestation and may be slight or marked. Elevations in temperature are usually intermittent but may be sustained for long periods. Early in the disease, the patient may be afebrile or the fever may be the presenting symptom. Anorexia, weakness, tachycardia usually occur, and loss of weight may be profound, leading to cachexia in the terminal phases. In other patients, weight loss may be minimal when the course of the illness is relatively short.

As indicated, the course is characteristically that of remissions and exacerbations with one or two organ systems being most prominently affected at a time. As the patient approaches the terminal stage, evidence of multiple organ involvement is common. The duration of the illness is usually from a few months to a few years with extremes of a few weeks to 20 years. The illness almost invariably ends fatally, although a few so-called recoveries have been reported.

Diagnosis can be made by muscle biopsy if the muscle is involved. The site should be chosen whenever possible where there is pain or tenderness. Polyarteritis was established by biopsy in six cases at the Albany Hospital. In several other cases, biopsy was negative yet the subsequent course or autopsy indicated the disease. In one patient, the initial biopsy was negative but a subsequent one was positive. Skin or nodule biopsy is often fruitful.

There are combinations of symptoms and signs that should suggest the possibility of polyarteritis but as with any diagnosis one has to think of it first. Remember it is a great simulator. Since 1945, every case (11) except one proven at postmortem examination or by biopsy at the Albany Hospital, was suspected clinically. This is not a diagnosis that is made only at autopsy as is so often thought, and therapeutic considerations make it even more important to establish its presence.

Treatment is unsatisfactory. Clinical remissions and healing of the vascular lesions pathologically have been reported with cortisone and ACTH. In five patients treated with ACTH, there was no significant long-term improvement. In two patients, cortisone caused an apparent clinical remission.

The careful administration of ACTH and cortisone should be seriously considered—at least until further evaluation of its usefulness can be made. Symptomatic treatment is indicated and possible sensitizing drugs



should be avoided. (Runyan, J. W. Jr., Beebe, R. T., Polyarteritis Nodosa: GP, XII: 101-107, October 1955)

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### Clinical Studies of Metaraminol

The present study was undertaken to assess the vasopressor agent, metaraminol (Aramine) in the management of shock. "Shock" is a descriptive term for a clinical sequence of events, the physiological causes of which remain obscure. A differentiation is often attempted between "medical" and "surgical" shock. Medical shock is usually defined in terms of a loss of circulating fluid due to a pooling or stagnation of blood in paralyzed dilated visceral and peripheral blood vessels. The precise locus of pooling is disputed. In the case of surgical shock, actual loss of some blood or plasma occurs through an area of injury. It is apparent that these concepts have limited utility because other factors, such as dehydration, infection, and neurological injury, cause and complicate shock through a combination of mechanisms.

While the state of shock is progressive, it is reversible, at least up to some point and it is this feature which merits particular therapeutic attention. There is general agreement that, when blood is lost from the intravascular compartment or when pooling takes place in distended peripheral vessels, venous return to the heart becomes deficient. This results in inadequate ventricular filling and a fall in cardiac output. As the stroke volume falls, the arterial blood pressure cannot be maintained. Coronary blood flow is in turn decreased and in elderly patients myocardial infarction may occur. Insufficient coronary blood flow leads to defective myocardial contractility. Therefore, cardiac output is further decreased and arterial blood pressure continues to fall. These features lead to additional stagnation and pooling and a further reduction in venous return. A vicious cycle is begun.

The therapeutic value of vasopressor agents has been attributed to their vasoconstrictive action on "paralyzed" small blood vessels. As vascular tonus is restored, the pooled blood is recirculated. Venous return to the heart is increased and better ventricular filling permits a significant rise in cardiac output. With increased cardiac output and drug-induced vasoconstriction, blood pressure is elevated; coronary blood flow is improved; and myocardial contractility is restored. Moreover, vasopressor agents such as noradrenalin (Levophed) and metaraminol have been shown by Sarnoff and his group to act directly on ventricular muscle fibers, and to produce a cardiotonic effect in a way similar to that obtained with the digitalis glycosides.

Metaraminol is a soluble, white-crystalline substance, and is stable as a dry powder. As a member of the sympathomimetic beta phenylethylamine group, it is a close structural relative of epinephrine, norepinephrine, and methoxamine (Vasoxyl). Effective by oral and parenteral routes, it is long-acting, presumably because of its structural insusceptibility to the actions of phenol and amine oxidases. The toxic dose for humans had not been established, but in the absence of complications from severe arterial hypertension, it is far beyond the average therapeutic range.

The definition and diagnosis of shock are based on a clinical manifestation created by different disease processes. A moderate state of shock, as defined by one observer, may be moderate hypotension according to the criteria accepted by another. Studies, including the present investigation, are hampered because shock as a clinical entity can be described so much better than quantitated. Series of patients reported by different authors are not readily comparable in analyzing the therapy of shock. Objectivity is achieved primarily by mortality data, postulating that only those patients are included who fulfill the criteria of the complete picture of shock and not hypotension alone. In this presentation, an attempt has been made to exclude individuals in whom there was doubt as to the presence of shock. Some indication of successful therapy is derived from the reversal of the shock state with therapy. At times, the least reliable—and yet the only numerical index of therapy for the individual case—is the rise in blood pressure.

As far as comparisons are possible, the results obtained in the present series with metaraminol compare favorably with those obtained with norepinephrine, and metaraminol has certain advantages.

Metaraminol is a valuable addition to those agents available in the treatment of shock. Excepting the two instances in which administration was followed by ventricular arrhythmias, the drug was free of undesirable side effects. The ease with which metaraminol can be given encourages its prompt use in shock. The value of this agent was particularly apparent in cases requiring prolonged pressor support. The use of subcutaneous injections at hourly intervals replaced the continuous norepinephrine drip, with its hazard of infiltration, local tissue necrosis, and the almost inevitable skin sloughs that follow several days of therapy. Because of its prolonged duration of action, the administration of metaraminol was much easier to control than norepinephrine and did not require constant observation by nursing personnel.

Norepinephrine is a more potent pressor agent than metaraminol and will at times produce a pressor response when metaraminol will fail to do so. Ultimate survival is unlikely, however, when norepinephrine is used after failure with metaraminol. The safety and practicality of metaraminol recommends its use as the pressor amine of choice in shock. Norepinephrine should be reserved for those instances in which metaraminol given intravenously is found to be ineffective. (Weil, M. H., Clinical Studies on a



Vasopressor Agent: Metaraminol (Aramine). II. Observations on its Use in the Management of Shock: Am. J. Med. Sc., 230: 357-367, October 1955)

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### Hypoglycemia in Infancy and Childhood

Recognition of patients with severe hypoglycemia is extremely important because the brain cells with their peculiar metabolism can use glucose only. In a young child whose brain is constantly growing and undergoing development, deprivation of food, as in hypoglycemia, causes serious brain damage. The patient with severe and prolonged episodes of hypoglycemia is likely to become feeble-minded or spastic, or both. This has been demonstrated very clearly in cases of diabetes in which patients have been repeatedly overtreated with insulin.

The symptoms and signs that occur in mild cases of spontaneous hypoglycemia are often so indefinite, so much like symptoms in other disease states, that it may be erroneously confused with the latter. Among children, the most frequent type of spontaneous hypoglycemia is primarily a disease of infancy, though occasionally it may persist into early childhood. Whether the idiopathic hypoglycemia among adults is of a similar nature, is not as yet known.

In dealing with patients suffering from certain common clinical disorders known to produce spontaneous hypoglycemia such as Addison's disease, pituitary insufficiency, severe hypothyroidism, von Gierke's glycogen storage disease and other forms of severe liver disease, the physician should be aware of the proneness to hypoglycemia, particularly after long periods of fasting. The physical stigmata which characterize the majority of such patients aid in the diagnosis. An ameliorating response to feedings should suffice to suggest the presence of hypoglycemia in many instances but determination of the blood sugar level at the proper time is essential for definitive diagnosis.

Other patients, particularly infants, without physical stigmata of primary disease who present signs and symptoms compatible with, though not pathognomonic of, spontaneous hypoglycemia, often present puzzling diagnostic problems to the physician. Because clinical manifestations of hypoglycemia are vague and irregular and fleeting in character, they are likely to be attributed to other functional disturbances, such as physiologic hunger, fright, "teething," excessive activity, and loss of sleep. When the affected individual is fed with some carbohydrate food or drink, he is revived so completely for a variable period of time that members of the family at first feel certain that there is nothing wrong with the baby.

If symptoms or signs such as "wilting spells," irritability, nervousness, muscular twitchings, tremors and jerking, transient strabismus, rolling or glassy expression of the eyes, pallor of skin and mucous membranes, flushing, quickening of the pulse, cold clammy sweats and other vasomotor manifestations are seen in an infant or complained of by older children, hypoglycemia should be strongly suspected. If these indications are known to be ameliorated by meals or a glucose solution but not by water sweetened with saccharin, the occurrence of hypoglycemia is practically certain. The final proof is demonstration of low blood sugar values.

Onset of severe hypoglycemic episodes may first be manifested by a generalized convulsion or an attack of coma, though these phenomena are usually preceded by the milder signs. When the latter have not been observed by the family doctor and signs of acute illness are not present, he is prone to discount the significance of the first convulsion or to attribute the reaction to what the child has eaten (instead of what he has not eaten). When the distraught mother calls him again because of similar convulsive episodes, he is likely to misdiagnose the condition as epilepsy for which he prescribes antiepileptic drugs, but usually without a favorable response.

When hypoglycemia is discovered, a battery of special tests may be made to determine more definitely the basic etiology of the disorder. These include: (1) the epinephrine injection test for the presence of glycogen stores in the liver and for the intactness of the glycogenolytic function (special test for von Gierke's glycogen storage disease); (2) corticotropin (ACTH) test for glycemic and eosinopenic responses to test intactness of adrenocortical function; (3) epinephrine-infusion eosinopenic test for responsiveness of hypothalamic-pituitary-adrenocortical system to this stress agent; (4) glucose tolerance test; and (5) insulin tolerance test.

When all the special tests fail to reveal any positive result other than hypoglycemia with increased glucose tolerance and decreased insulin tolerance, the diagnosis of infantile idiopathic hypoglycemia is warranted.

The principal features which characterize this clinical entity are as follows: (1) early age of onset (24 of 30 cases in this series began before the second year of life, only one began after the fifth year—hence the use of the term "infantile"); (2) absence of any peculiar physical stigmata; (3) all special tests for liver, adrenocortical, thyroid, and pituitary insufficiency negative; (4) familial tendency; (5) natural tendency to spontaneous recovery or amelioration of symptoms with increasing age; (6) uniformly favorable therapeutic response to corticotropin (ACTH). (Mc Quarrie, I., Hypoglycemia in Infancy and Childhood: Differential Diagnosis and Therapy: Postgrad. Med., 18: 287-293, October 1955)



### Accidental Ingestion of Poisons

The accidental ingestion of toxic materials by children is preventable. In an effort to answer this question, a statistical survey was made of children seen at Children's Memorial Hospital, Omaha, with a history of ingestion of poisonous or potentially poisonous materials.

The poisonous materials were divided into five groups: (1) medicines, (2) hydrocarbons, (3) household cleaning agents, (4) insect and rat poisons, and (5) miscellaneous. There were 67 drugs in the group of medicines. Ten different hydrocarbons and 14 agents for household cleaning were ingested. There were 10 different insect and rat poisons. The miscellaneous group included 37 products too variable to classify.

The most common medicines ingested by those treated as outpatients were aspirin, laxatives, thyroid, sulfonamides, cough syrup, and boric acid. Aspirin was encountered in one-third of the outpatients ingesting medicine. The aspirin, laxatives, thyroid, and sulfonamides were in tablet and pill form. Many of the cough syrups contained codeine. The boric acid was ingested either in the crystal form or as solutions mistakenly drunk for water.

Patients were most commonly hospitalized for ingestion of aspirin, barbiturates, and camphor (camphorated oil). Aspirin was again the most commonly encountered, making up 29% of those ingesting medicine. Admissions for aspirin poisoning were most common because of sheer numerical predominance of aspirin ingestion. Children ingesting barbiturates were hospitalized frequently due to the potential hazard of deep sedation and, occasionally, for extreme restlessness. One-half of the hospitalized patients ingesting camphorated oil had generalized convulsions.

The percentage according to sex showed the incidence of ingestion in both boys and girls to peak during the 1- to 3-year period. The incidence of poisoning in boys was higher than girls in this age group. After 3 years of age, there was no significant age difference. This was similar in both outpatients and hospital patients.

Ingestion according to sex showed that 59.9% of the outpatients and 61.5% of the hospital patients were boys. Girls represented 40.1% of the outpatients and 38.5% of the hospital admissions. This emphasizes a known basic sex difference in the investigative nature of the male child, especially in the 1- to 3-year group.

There were five deaths. They were due to the ingestion of Nupercaine ointment by a 2-1/2 year-old female; turpentine by a 1-1/2 year-old male; iron pills by a 1-1/2 year-old female; Pride furniture polish by a 1 year-old male; and Dibistine antihistamine tablets by a 3 year-old female. Medicines constitute the largest group of poisoning problems. The elimination of this group alone—which is probably the most easily

preventable, would reduce poisonings by about 45%. The elimination of aspirin alone would reduce the total poisonings by 15%. It should also be emphasized that households with children between the ages of 1 and 3 years of age should be especially vigilant, particularly if these adventurous youngsters are boys. (Stanage, W.F., Henski, J.A., Accidental Ingestion of Poisons; J. Pediat., 47: 470-474, October 1955)

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### Cold-Injury Sequelae

Analysis of this series of 54 patients with residuals of cold injury demonstrates the difficulty in evaluating the clinical status of patients, who have primarily subjective complaints and a lack of specific objective findings.

These patients presented a well-defined and frequently substantiated history of cold injury and a group of complaints consistent with those described by other observers. Aching, burning or sharp pain, cold reactivity, and increased sweating in the affected extremities following injury were most prominent symptoms; paresthesias, color changes, dermatitis, and swelling were described less frequently.

Objectively, manifestations such as hyperidrosis, dermatitis, and color changes were observed frequently; edema, orthopedic deformities due to muscular atrophy and fibrosis, and neurologic abnormalities evidenced by hyperesthesias were less common. In some patients, emotional disturbances of varying severity were present. Manifestations were usually nonspecific and consistent with other vascular, dermatologic, neurologic, orthopedic, and psychic disorders.

Treatment in this group was symptomatic. Control of pain by means other than rest was often unsatisfactory, although partial improvement occurred in a number of patients. More gratifying was the relief of dermatitis by careful local management, supplemented in some cases by systemic measures directed at relieving hyperidrosis and coldness. In certain patients, particularly those with hyperidrosis and dermatitis, sympathectomy was a useful adjunct, although complete improvement did not occur in all cases following this procedure. Proper foot hygiene, supportive orthopedic procedures, restriction of activity, and avoidance of cold exposure were valuable aids in management. Nevertheless, results from treatment in this series were often inadequate and 66.7% of patients were discharged to civilian life.

Studies of both early and late cold injury have emphasized the importance of the vascular changes in the affected areas. These have not revealed well-defined organic vascular disease, although there is lack of agreement on this point. In local injuries, clinical observations have



demonstrated neural involvement, and experimental studies have demonstrated the important effects on nerve shown to be a tissue particularly susceptible to injury by cold.

Following cold injury, some individuals may have only negligible symptoms such as mild reactivity to cold. Others are disabled with any activity or with a gainful occupation. In addition, they may have associated psychic factors of such severity that evaluation is difficult.

In the diagnosis and management of these patients as they are seen sporadically in civil life, the following factors are important: An accurate and preferably substantiated history of cold injury is requisite. If this specific information is not obtained, the diagnosis of cold injury should be doubted. A helpful and informative approach would be careful follow-up of each patient from the time of injury throughout the entire course of illness. In patients with late cold injury syndromes, the integrated clinical picture is most informative. Organic vascular disease, syndromes with sympathetic overactivity and malingering must be differentiated.

Present laboratory methods have not been of specific aid in the diagnosis of cold injury residuals, even when studies of known injured have been compared with normal controls. These, however, have usually been methods to evaluate the circulatory status of these patients. Specialized procedures, such as skin temperatures, oscillometric and cold-room studies, have largely shown evidence of increased vasomotor activity in some individuals, a finding present in other peripheral vascular states. Roentgenographic studies do not demonstrate diagnostic changes.

Management of these patients is inadequate, although symptomatic relief of varying degree can be obtained in some individuals. (Shafer, J. C., Thompson, A. W., Local Cold Injury, a Report of Sequelae: Arch. Dermat., 72: 335-344, October 1955)

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#### Transurethral Prostatic Resection

This article represents a detailed study for comparative analysis of 1000 consecutive cases of transurethral prostatic resection. The authors were interested primarily in the factors which could be compiled accurately in this series, such as weight of tissue, number of hospital days, and hospital deaths. The article deals more with these facts than the intangible aspects such as history, symptoms, morbidity, or preoperative estimation of size of the gland. Constant factors which are present in this series are the same operators, the same technique employed in transurethral prostatic resection, and the same type of instruments used throughout the series.

The authors consider as criteria of a successful transurethral prostatic resection, that the patient should (1) be afebrile by the fifth postoperative day, (2) be ambulatory on the second postoperative day, (3) have the catheter removed on the third postoperative day, (if the temperature is elevated above 100° F. or the drainage shows gross hematuria, the catheter is not removed), (4) be able to void free stream, (5) have good urinary control before leaving the hospital, (6) leave the hospital by the eighth postoperative day, and (7) not complain of undue pain or discomfort in voiding.

Statistical analysis of the 1000 consecutive private patients who had transurethral prostatic resection is presented with summaries and correlations; comparison has been made of two series a decade apart. The average time in surgery for all grades, excluding bars and contractures, was 44.5 minutes, during which time an average of 37 gm. of tissue were removed. This included additional procedures at the time of surgery. Eighty-one percent of the resections were completed in less than one hour. When the operative time was increased, there was a proportionate increase in hospital mortality.

There was 1 lower nephron nephrosis in the 8 hospital deaths whose surgical time was less than 44 minutes. Three out of 5 cases of hospital deaths, in which the surgery was over one hour, could be attributed to the prostatic surgery. There was an increase in mortality of patients who had largest glands which required prolonged resecting time in surgery. Less morbidity was noted in patients whose surgery lasted for 44 minutes or less.

Of the 1000 cases reviewed, 157 had carcinoma. There was an error in the clinical diagnosis of malignancy by rectal palpation in 3.1%. Carcinoma would have been missed in 11% of the patients if selected pieces of tissue from the deep dorsal portion of the gland near the verumontanum had not been saved for histopathological examination. One-third of all malignancies were classified as grade 3 in a grade 1-4 classification. Three hospital deaths (6%) had grade 3 adenocarcinoma with metastases. There was a definite decline in good results obtained in the higher grades of malignancy. In the cases of carcinoma, a marked increased morbidity was seen in the grade 4 malignancies and the results were much less favorable in the patients who had a higher grade of malignancy.

Little difference in temperature elevation was observed in comparing the two series a decade apart, but there was a decrease in hospital days in the more recent surgery. The greatest difference in the two decades was in hospital days. Seventy percent of the patients in the 1940 series remained in the hospital longer than 8 days, while only 42% of those done a decade later were hospitalized more than 8 days. In 33 cases with perforation of the prostatic capsule, there were 3 hospital deaths. Water was used as the irrigating fluid in all 3 cases. One had advanced malignancy with metastases. Thirteen out of 33 cases perforated were drained suprapubically.



Perforation was not a major problem if nonhemolytic irrigating fluid was used, as the 3 deaths occurred in those cases in which water was used. Complications following perforation of the capsule can be minimized by (1) prompt recognition of the signs and symptoms as well as the endoscopic appearance, (2) careful avoidance of overdistention of the bladder after perforation, and (3) suprapubic drainage of the periprostatic area.

In 4 cases in which 50-99 gm. of tissue were resected, 2 died of lower nephron nephrosis and 1 of pyelonephritis. Twelve hospital deaths occurred where 49 gm. or less of tissue were resected. Of 6 cases of lower nephron nephrosis, 3 recovered. Five and three-tenths percent of the patients were returned to surgery for removal of prostatic tags before leaving the hospital. The obstructing tags predominantly occurred at the apex of the prostate in the region of the verumontanum. Of the transurethral prostatic resections in this series, 3.3% had a recurrence of obstruction on an average of 5-1/2 years later. Nine of the 33 cases had adenocarcinoma of high grade obstructive malignancy. One died of surgical shock, 3 of carcinoma with metastases.

Seven hundred and forty cases of the 1000 studied had no morbidity in their postoperative convalescence. There was less morbidity in the patients whose age ranged between the sixth and eighth decades. The largest group of hospital deaths occurred in the eighth decade. The overall hospital mortality in 1000 cases was 1.8%. Postoperative hospital days have been cut down considerably in the past decade.

Prostatic tags needed removal in 5.3% of all transurethral prostatic resections. The morbidity was less in the age group between sixth and eighth decades, while the mortality rose directly with the age. The 5% increase in good results in the more recent series would indicate an improvement trend in endoscopic prostatic surgery. (Bergman, R. T., et al., Comparative Analysis of One Thousand Consecutive Cases of Transurethral Prostatic Resection: J. Urol., 74: 533-545, October 1955)

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### Virus Infections of Interest to the Dentist

Since effective antimicrobial therapy has made possible the control of a large majority of bacterial infections, increasing interest has been focused on infections of viral origin. Viral infections of interest to the dentist may be grouped into three categories.

#### I. Viral Infections with Prominent Oral Manifestations

Small oral lesions are often seen by the dentist much earlier than by the physician. In many viral infections, oral lesions occur principally

very early in the disease, at the end of the incubation period, or during the prodromal stage which precedes typical symptoms of the disease. Outstanding examples are the mouth lesions of the infectious diseases of childhood such as measles and chicken pox. These are best seen at the beginning of the prodromal stage when the child still feels well and may visit the dentist for a routine checkup or corrective orthodontics. Infection with herpes simplex virus gives prominent oral manifestations during both the primary infection and the later recurrent lesions. A majority of persons acquire infection during childhood or adolescence and continue to carry the virus for life. The primary disease is generally an acute gingivostomatitis with fever, gingival inflammation, and marked tenderness which interferes with eating, foul breath, and a vesicular eruption on the oral mucosa with tender, enlarged, regional submaxillary and cervical lymph nodes. The signs and symptoms of primary herpes generally subside in about two weeks and subsequently the patient maintains an antibody titer in the blood serum, probably for the rest of his life. Rare persons develop herpetic meningo-encephalitis or lesions of extraoral mucous membranes such as herpetic vulvovaginitis as part of the primary infection.

The relationship of herpetic lesions to so-called recurrent aphthous ulcers, aphthous stomatitis, canker sores, or recurrent aphthae, is an uncertain one. Histologically, these lesions show only mild inflammatory changes and round-cell infiltration but none of the typical pathologic changes of herpes. Morphologically, they resemble herpetic lesions of the primary infection and are commonly found on the buccal mucosa, buccal sulcus, gingivae, tongue, or floor of the mouth. Thus, they closely resemble herpetic lesions. Some such aphthous ulcers may well be herpetic in origin, and virus can be isolated from such mouths; yet, others occur in persons without antibody to herpes simplex virus, and virus isolation is not possible.

It seems likely that the genesis of epidemic outbreaks of "trench mouth" is associated in children or adolescents with epidemic dissemination of herpes virus infection followed by an upsurge of the "trench mouth" organisms, that is, anaerobic spirochetes and fusiform bacilli. These microorganisms are present in every normal mouth but increase in number in the favorable anaerobic environment of necrotic mucous membranes and subsequently contribute to tissue damage.

## II. Viruses Which May be Transmitted Accidentally by the Dentist to His Patient

Foremost in this group are the viruses of hepatitis. Two distinct agents are known to produce the clinical picture of anorexia, nausea, weight loss, and fever, with derangement of liver function ranging from minimal biochemical abnormalities to gross jaundice, clay-colored stools, dark urine, and marked bleeding tendency.



The etiological agents responsible for the syndromes of hepatitis are two viruses generally referred to as "infectious hepatitis virus" (IH) and "serum hepatitis virus" (SH). Both are very resistant to many chemical and physical agents which destroy most other viruses.

The common mode of transmission of infectious hepatitis (IH) is through fecal contamination of fingers, food, or water. Both IH and SH viruses can be transmitted, by a variety of methods, through human blood and its derivatives. These include transfusion or injection of human blood, plasma, or serum (or certain substances prepared from them) and infection from improperly sterilized syringes, needles, lancets, or other instruments contaminated with human blood. Gamma globulin prepared by the ethanol-precipitation method of Cohn, and albumin similarly prepared and then heated are safe and do not transmit the virus but topical thrombin may not be safe.

The infectiousness of human blood or plasma may be exceedingly high. On some occasions, as little as 0.00001 cc. of blood proved to be infectious. This makes it clear that apparently "clean" instruments, needles, or syringes may readily transmit the infection by retaining minute amounts of infectious blood. It is known that hepatitis viruses may be present in blood for many months after a subclinical or clinical infection.

The problem is aggravated and the danger increased by the fact that both hepatitis viruses are highly resistant to chemicals and relatively resistant to heat. Furthermore, certain inherent technical difficulties of sterilization are important. Thus, syringes and needles often carry adherent air bubbles when placed in boiling water, and in such areas the blood or plasma may not be sterilized. At other times, surface coagulation may protect the underlying bits of plasma or blood from good heat penetration. These factors are of particular importance when an attempt is made to sterilize instruments by exposure for only a few minutes to boiling water. For absolute safety, it must be insisted, therefore, that all potentially contaminated instruments be autoclaved (fifteen minutes at 15 pounds pressure) or sterilized by dry heat (170° C. for one hour). Only in this fashion can the safety of patients be insured and medicolegal complications avoided.

Because poliomyelitis viruses are also resistant to chemicals and are widely distributed during epidemic periods, it has been suggested that this virus could be transmitted by dental procedures and by contaminated and inadequately sterilized instruments or materials. Convincing evidence of actual transmission is lacking. It is well established, however, that operative procedures and trauma to the upper respiratory tract, as well as injections of harmless materials elsewhere, can precipitate paralytic poliomyelitis. There is suggestive evidence that tooth extractions and other major dental operative procedures can precipitate a similar sequence and should, therefore, be limited to emergencies during the epidemic period.

### III. Viral Infections Which the Dentist May Acquire Accidentally from His Patients

Accidental inoculation (needle scratch or puncture, cut, et cetera) with an instrument contaminated with blood is a recognized professional risk of acquiring hepatitis. Dentists and doctors, technicians, and other medical personnel are subject to this risk and it has been accepted that employees acquiring hepatitis in the course of their occupation are eligible for compensation. Awareness of the risk and attention to proper aseptic precaution and sterilization procedures can minimize the hazard.

The viral infections to which the dentist is more frequently exposed in the course of his work are the common respiratory ailments, particularly the common cold, influenza, and other viruses causing acute respiratory diseases. All of these agents are transmitted by droplets from the patient's upper respiratory tract, particularly during talking, coughing, and sneezing. As the dentist bends over the wide-open mouth, he is virtually an ideal receptacle for all virus-laden droplets propelled from the patient's oropharynx.

Because of the intense exposure, the dentist suffers during epidemic times of respiratory illnesses, he is particularly interested in prophylactic measures. It may be stated summarily that to date none of the proposed nostrums have any preventive effect against the common cold and no specific vaccines are available. (Jawetz, E., Virus Infections of Interest to the Dentist: Oral Surg., 8:1069-1073, October 1955)

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The printing of this publication has been approved by the Director of the Bureau of the Budget, 16 May 1955.

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### Dental Care

Dental care and treatment rendered by the Dental Department constitutes a major part of the workload of the over-all medical program. The ultimate objective is to provide the best possible dental health service to active-duty Navy and Marine Corps personnel. The quantity of dental care provided and accessibility of dental facilities govern to a large degree the extent of time lost due to dental ailments. An individual with a dental condition can be as noneffective as one with an injury or disease



problem. Dental care is provided for personnel in most of the larger land, sea, and air activities, whether afloat or ashore.

The data in this article were abstracted and summarized by the Dental Division from the Dental Service Report (DD Form 477) received from all activities providing dental care. The statistics involve only four selected aspects of dental service rendered—"Operative dentistry," "Prosthodontics," "Oral surgery," and "Periodontics." Other types of service such as "Radiodontics" are not included in this summarization.

During the 1955 fiscal year, a total of 4,272,359 of these selected dental procedures were reported from Navy dental facilities—about the same number performed during the preceding fiscal year. "Operative dentistry" accounted for the bulk of the selected dental procedures—three-fourths of the total—during the 1955 fiscal year. "Oral surgery" and "Periodontics" were almost equal in number—constituting 12% and 11% of the dental care. "Prosthodontics," the remaining category, accounted for only 2% of the selected aspects of dental service.

One type of procedure stood out in each of the four selected dental classifications. In "Operative dentistry," restorations (amalgams, resins, and silicates) accounted for 68% of the class total. Dentures (both full and partial) comprised two-thirds of the prosthodontic treatment. "Tooth removal" comprised 91% of oral-surgery treatment, and oral prophylaxis accounted for less than one-half of the periodontic treatment.

As would be expected, the vast majority of the dental treatment rendered in fiscal year 1955 was to active-duty Navy and Marine Corps personnel. Supernumeraries accounted for less than 2% of the dental procedures—Army and Air Force patients receiving a large part of these. Dependent dental care, which is given as an adjunct to hospitalization or as an emergency or humanitarian measure, was less than 1% of the total treatment. Most dependent dental care is given at naval activities outside the continental limits of the United States.

Nearly two-thirds of the dental care was rendered in activities located in continental United States. Distribution of the types of dental care provided in the major geographic areas is illustrated. Little difference existed between the two areas—Pacific and Atlantic—when comparing the amounts and types of dental care. A rather large proportion of the periodontic treatment (47%) was given in noncontinental dental facilities.

More than one-fifth of the selected dental procedures were performed at the five recruit training activities. The population at recruit training activities is composed of both staff personnel and individuals undergoing "boot" training. However, recruits receive the bulk of the dental care at these centers. During the period of basic training, an attempt is made to accomplish the most urgently needed dental treatment.

A dental examination is required for recruits entering basic training. This is accomplished as soon after arrival at the training activity as practical.

Of those examined, about 92% required treatment; 90% required restorative dentistry. About one-third in addition were in need of extractions. A higher proportion of new Navy recruits required dentures than of the Marine Corps—6% as compared with 4%, respectively. When one considers that about 125,000 recruits entered the naval service during the 1955 fiscal period, one can then see the extent of the services required for recruits.

In all, a total of 905,821 selected dental procedures and treatments were provided at recruit training facilities during fiscal year 1955. Operative dentistry accounted for 653,003 procedures, or 72% of the total. Oral surgery accounted for almost one-quarter million treatments, representing about 22% of procedures performed. Of the remaining dental treatments rendered at recruit training activities, periodontic treatment accounted for 4% and prosthodontic treatment for less than 2% of the total. (Statistics of Navy Medicine, Dental Care: 11: 29-32, October 1955)

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#### Prediction of a Criterion of Flight Safety in Naval Aviation

This study was designed to investigate differential accident liability among naval flight personnel. A number of studies in industry have indicated that in any given work group some individuals contribute disproportionately to the total number of accidents. This study evaluated one means of identifying such individuals in aviation. In addition, the following variables were investigated in terms of their relationship to a pilot's placement on continua of safeness and skill as a pilot: (1) attitudes toward various aspects of naval flying, (2) subjective evaluations of flight safety procedures and, (3) the galvanic skin response of a pilot recorded as he views statements concerning these same items of flight safety procedure.

Ninety pilots assigned to a U.S. Navy aircraft carrier were used as subjects in this study. These pilots evaluated by means of "peer ratings" the other members of their squadron both as to "safeness" and skill. A criterion of accident liability derived from these ratings was found to possess certain advantages over other criteria. The peer ratings were easily obtained, were reliable, and could be predicted by each of the independent variables used in this study.

Multiple regression analyses indicated that major differences exist between low ranking and high ranking officer groups with respect to the manner in which the above variables are related to the criteria. Such differences may be a function of greater experience in flying on the part of the high ranking officers. For predicting relative safety and skill, multiple correlation coefficients were obtained ranging from .48 to .68. All were significant at the .01 level of confidence.



Since the criteria of a good pilot are that he be both safe and skillful, a canonical correlational analysis was made to determine the efficiency with which a pilot could be placed on both continua simultaneously. A coefficient of .58 was obtained for the Ensign group and .74 for the higher ranking officer group.

On the basis of this study, the use of peer rating procedures as a means of establishing criteria of differential accident liability is recommended.

Measures of attitudes toward aspects of naval aviation; subjective evaluations of flight safety procedures; and measures of galvanic skin responses accompanying the viewing of items of flight safety procedure are demonstrated to be effective predictors of both the flight safety and skill criteria. (Naval Medical Research Institute, NNMC, Bethesda, Md., NM 001 056.08.01, 1 August 1955)

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#### Attention All Medical Department Officers !

The Bureau of Medicine and Surgery has noted an increasing number of Medical Department officers travelling on authorization orders from local commands to participate in or attend foreign scientific meetings and to visit medical institutions or installations.

In order that information and experience gained may be shared by this Bureau and possibly other interested departments, it is requested that, when officers are routed through Washington, they visit the Bureau of Medicine and Surgery, Code 41B, for briefing on points of interest to the Medical Department. When points of embarkation are not via Washington, then on return from such visits a report should be made to the Bureau of Medicine and Surgery, Attention Code 41B, to include a program and a list of the members in attendance at such meetings as well as information on the meeting, on any scientific institutions visited, and other pertinent medical information concerning the countries visited. The procedure outlined in Article 23-124 Manual of the Medical Department should be followed insofar as possible. (PersDiv, BuMed)

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#### Board Certifications

##### American Board of Anesthesiology

LCDR Isadore Gross (MC) USNR (Active)

LT Francis X. Le Tard (MC)USNR (Inactive)

LT Robert J. Taylor (MC) USNR (Inactive)

American Board of Internal Medicine

LT Jules F. Bittner (MC) USNR (Inactive)  
LTJG Charles E. Clement (MC) USNR (Inactive)  
LTJG Milton G. Crane (MC) USNR (Inactive)  
LT Paul D. Doolan (MC) USN  
LT Lloyd W. Espen (MC) USNR (Active)  
LTJG Richard F. Jones (MC) USNR (Inactive)  
LT Jack J. Lewis (MC) USNR (Inactive)  
LT John H. Lindberg (MC) USNR (Inactive)  
LTJG John B. Long (MC) USNR (Inactive)  
LTJG William T. Miller (MC) USNR (Inactive)  
LT Ralph J. Spiegl (MC) USNR (Inactive)  
LTJG John H. Stalnaker (MC) USNR (Inactive)  
LCDR Chester S. Svigals (MC) USNR (Active)  
LTJG David R. White (MC) USNR (Inactive)

American Board of Obstetrics and Gynecology

CDR Roland A. Christensen (MC) USN  
LCDR James H. Harris (MC) USN  
LTJG Joseph S. Lattimore (MC) USNR (Inactive)  
LTJG Thomas A. Sinclair (MC) USNR (Inactive)

American Board of Ophthalmology

LT Louis Stadnik (MC) USNR (Active)

American Board of Orthopedic Surgery

LTJG James J. Gilly, III (MC) USNR (Inactive)

American Board of Pathology

LTJG Kenneth R. Dugan (MC) USNR (Inactive)  
LT James J. Humes (MC) USN  
LTJG James B. Hutcheson, III (MC) USNR (Inactive)  
LT Robert J. Peace (MC) USNR (Inactive)  
LCDR Maurice R. Schmoyer, Jr. (MC) USN

American Board of Pediatrics

LT Thomas A. Anderson (MC) USNR (Active)  
LTJG Ira A. Budwig, Jr. (MC) USNR (Inactive)  
LT Delmer J. Pascoe (MC) USN  
LT Earl R. Peters (MC) USN  
LT Morton E. Pizer (MC) USNR (Inactive)  
LTJG Henry M. Rogers, Jr. (MC) USNR (Inactive)  
LT Howard J. Williams, Jr. (MC) USNR (Inactive)  
LT Thomas B. Wright (MC) USNR (Active)



American Board of Preventive Medicine (Aviation Medicine)

CDR Edward L. Beckman (MC) USN

CDR Carl E. Wilbur (MC) USN

American Board of Psychiatry and Neurology in Psychiatry

LT Arthur M. Blood (MC) USNR (Inactive)

LT Andre C. L. Touzet (MC) USNR (Inactive)

American Board of Radiology

LT Martin D. Smith, Jr. (MC) USNR (Inactive)

American Board of Surgery

LTJG Marshall D. Baxter (MC) USNR (Inactive)

LT Felix G. Cataldo (MC) USNR (Inactive)

CDR George O. deTarnowsky (MC) USN

LT Robert A. Loeffler (MC) USN

CDR Romulus L. May (MC) USN

LT Luther H. Parr (MC) USNR (Inactive)

LCDR William C. Turville (MC) USNR (Active)

American Board of Urology

LCDR Robert H. Bradley, Jr. (MC) USNR (Inactive)

LT Clarence B. Dawson (MC) USNR (Inactive)

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Recent Research Projects

Naval Medical Research Institute, NNMC, Bethesda, Md.

1 The Importance of Elastic Lamellae in Aortic Grafts, and a Technique for the Experimental Production of Aortic Aneurysms. NM 007 081.10.10, 25 May 1955.

2 Experimental Coronary Occlusion Using a Polyethylene Tube: A Preliminary Report. NM 007 081.26.01, 26 June 1955.

3 Identification and Quantitative Estimation of Iron Pentacarbonyl in Commercial Carbon Monoxide. NM 001 056. 10.01, 26 June 1955.

4 Failure of Freeze-Dried Homologous Arteries Used as Ureteral Grafts. NM 007 081.10.12, 27 June 1955.

5 Present Status of Our Experiments with Freeze-Dried Grafts. NM 007 081.10.14, 27 June 1955.

6 Failure of Freeze-Dried Arteries Used as Heterografts for Esophageal Replacements. NM 007 081.10.15, 27 June 1955.

Naval Medical Research Institute, NNMC, Bethesda, Md. (continued)

- 7 The Use of Small Laboratory Animals in Medical Radiation Biology. IV. Correlation of Physical Factors with the Biological Effect Produced by Total-Body Irradiation of Guinea Pigs. NM 006 012.04.81, 27 June 1955.
- 8 Kinetic Studies of the Myosin-Tripolyphosphate System. NM 000 018.11.03, 29 June 1955.
- 9 Ventricular Fibrillation in Dogs after Sudden Return of Flow to the Coronary Artery. NM 007 081.26.02, 29 June 1955.
- 10 Experimental Determinations of the Diffusion Coefficients of Gases Through Water: Nitrogen and Argon. Project X-43, Report No. 5. (NM 002 001) 29 June 1955.
- 11 Freeze-Dried Arteries Used as Tendon Sheaths. NM 007 081.10.13, 29 June 1955.
- 12 Transplantation of Tissues. Lecture and Review Series No. 55-4, 14 July 1955.
- 13 Result of a Shipboard Dysentery Control Program. NM 005 048.04.19, 25 July 1955.
- 14 Some Physiological Observations in the Bear with Emphasis on Adrenal Cortical Function in Hypothermia. Memorandum Report 55-3, NM 007 081.22, 25 July 1955.
- 15 Silicone Rubber as Aortic Grafting Material. Memorandum Report 55-4. NM 007 081.19, 2 August 1955.
- 16 The Enthalpy Change of Adenosine Triphosphate Hydrolysis. NM 000 018.06.39, 12 August 1955.
- 17 Skin Lesions, Epilation and Nail Pigmentation in Marshallese and Americans Accidentally Contaminated with Radioactive Fallout. NM 006 012.04.82, 29 August 1955.

Naval Dental School, NNMC, Bethesda, Md.

- 1 A study of the Possible Retention of Fluoride Ion by the Organic Phase of Dentin. NM 008 015.07.01, 1 August 1955.

Naval Medical Research Unit No. 3, Cairo, Egypt

- 1 Fibrosis of the Liver of Egyptian Children and Adults. NM 007 082.25.02.
- 2 Fibrotic Contracted Urinary Bladder Associated with Schistosomiasis and Chronic Ulceration: A Clinicopathological Study Including Treatment. NM 007 082.31.04.
- 3 Some Observations on the Abada Tribespeople of the Eastern Desert of Egypt. NM 007 082.09.07.



Naval Medical Research Unit No. 3, Cairo, Egypt (continued)

- 4 Chronic Ulcer of the Bladder Associated with Schistosomiasis. NM 007 082.31.02.
- 5 Incidence of Endamoeba Histolytica on Fresh Vegetables in the Cairo, Egypt Area, and Studies on Chlorination. NM 005 050.58.01.
- 6 Methods of Bicrobiological Analysis of the Liver. NM 007 082.26.02.I.
- 7 Notes on African Haemaphysalis Ticks. III. The Hyrax Parasites, H. SP. NOV., H. Orientalis N. and W., 1915 (New Combination), and H. Cooley I Bedford, 1929 (Ixodoidea, Ixodidea) NM 005 050.29.24.
- 8 Study of the Etiology of "Acclimatization Diarrhea" Among Americans in Egypt. NM 005 083.07.07.
- 9 Endocrine Factors in the Water Metabolism of the Desert Mammal, G. Gerbillus. NM 005 050. 54.01.

(To be continued in the next issue of the News Letter)

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BUMED INSTRUCTION 6710.21

28 October 1955

From: Chief, Bureau of Medicine and Surgery  
To: All Ships and Stations

Subj: Defective medical and dental material; authority for disposition of

Ref: (a) Medical and Dental Materiel Bulletin, Edition No. 59 of  
1 October 1955  
(b) Art. 25-21, ManMedDept

This instruction provides authority for the disposal of defective material listed in paragraph IV of reference (a).

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BUMED NOTICE 6730

28 October 1955

From: Chief, Bureau of Medicine and Surgery  
To: All Ships and Stations Having Medical Personnel Regularly  
Assigned

Subj: FSN 6515-362-8200, Rule, Refracting, Ophthalmological;  
disposition of nonstandard material listed under

Ref: (a) Subarts, 15-62 (16) and (17), ManMedDept  
(b) Art. 25-21, ManMedDept

This notice provides authority for the disposal of nonstandard material.

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BUMED INSTRUCTION 6710.22

1 November 1955

From: Chief, Bureau of Medicine and Surgery  
To: All Ships and Stations

Subj: Defective medical and dental material; authority for disposition of

Ref: (a) Medical and Dental Materiel Bulletin, Edition No. 55 of  
1 June 1955  
(b) Art. 25-21, ManMedDept

This instruction provides authority for the disposal of defective material listed in paragraph IV of reference (a).

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BUMED INSTRUCTION 6780.1A

1 November 1955

From: Chief, Bureau of Medicine and Surgery  
To: Distribution list

Subj: First aid kits for aircraft and flight personnel

This instruction insures availability, prescribes allowances, and disseminates information relative to first aid kits for aircraft and flight personnel.

(a) First Aid Kit, Survival, Individual, Federal Stock No. 6545-299-8313. This item is a multi-purpose survival kit designed for self-treatment.

(b) First Aid Kit, Airplane, Without Narcotics, Federal Stock No. 6545-919-6650. This item provides medical material for self-administered first aid.

BuMed Instruction 6780.1, dated 2 January 1953, is canceled.





## MEDICAL RESERVE SECTION

### Professional Fitness for Promotion

Naval Reserve officers on inactive duty are required to attain the minimum number of retirement points (currently 12 each fiscal year) and establish professional fitness for promotion by satisfactory completion of active duty, active duty for training, inactive duty training (drills), and/or satisfactory completion of correspondence courses or certain residence courses of instruction.

For promotion to the grades of Lieutenant, Lieutenant Commander, Commander, and Captain, officers must earn an average of 24 promotion points for each year in grade in the Naval Reserve. The number of years in grade shall be computed from 1 July following date of rank (or date of rank if it happens to be 1 July) to 30 June of the fiscal year in which selected for promotion. In no case shall more than 144 promotion points be required. This provision does not require the earning of 24 promotion points during each year in grade; it provides that an "average" of 24 points must be earned for each year in grade. Thus, if one is in grade for, say, 5 years, he would have to earn 120 promotion points.

Effective 1 July 1955, promotion points shall be awarded to Naval Reserve officers for:

- 1 Completion of approved correspondence courses or normally creditable portions of correspondence courses.
- 2 Participation in inactive duty training program. Twelve promotion points will be awarded for whichever of the following phases is completed first during any fiscal year: (a) Attendance at 75% of prescribed drills. If you belong to a unit that holds 48 drills each year, for example, you must attend at least 36 drills. At least 12 scheduled drills must be attended to earn 12 promotion points by this means; or (b) satisfactory completion of 14 days' active duty, including training duty; or (c) satisfactory completion of at least 14 periods of appropriate duty.

Promotion points will not be awarded for completion of more than one of the following three phases in any one fiscal year:

- 1 Extended active duty (not including training duty), completed prior to 1 July 1955. One promotion point has been awarded for each month of continuous active duty between 1 July 1950 and 1 July 1955.
- 2 Completion of each course in which enrolled in a Naval Reserve Officers School, provided such course is listed in the promotion plan as being applicable to the grade and designator of the officer, and provided further that a correspondence course in the same subject has not already been credited for promotion points. The number of promotion points to be credited for NROS courses may be evaluated and assigned by the Chief of Naval Personnel.
- 3 Satisfactory completion of other approved training or instruction, with number of promotion points evaluated or assigned by the Chief of Naval Personnel.

#### What You Must Do if Selected

When you receive your notice of selection, it becomes your responsibility to take whatever action is necessary to complete your professional qualifications. When these professional qualifications have been met, it is your responsibility to request a physical examination from the commandant holding your Officer Service Record.

After you have established both professional and physical qualifications, you must originate a request for appointment to the higher grade. This request will be addressed to the Chief of Naval Personnel, via the commandant holding your service record who will certify by endorsement that the prescribed qualifications have been established. The request must be received in the Bureau of Naval Personnel before the convening date of the second selection board following the board which recommended you for promotion. (The Naval Reservist, September 1955)

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#### Change of Address

Please forward requests for change of address for the News Letter to: Commanding Officer, U.S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

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## PREVENTIVE MEDICINE SECTION

### Plague

(Reprinted are pertinent sections of the revision of Army Technical Bulletin No. 124, with necessary editorial changes in adopting it for publication in the Medical News Letter. Physicians in the United States where plague has been rendered almost nonexistent except in the Sylvatic form, may not be familiar with the potential problems posed by the disease in many parts of the world. Should public health control measures fail for any reason, in many parts of the United States, epidemic plague might become a considerable problem in this country. An important part of the preventive medicine problem is a sufficient degree of clinical suspicion to allow identification of the early phase of an epidemic. Therefore, the clinical aspects should be learned by every physician.)

### Etiology and Transmission

Plague is an acute infectious disease caused by Pasteurella pestis, which is epizootic among rats and other rodents. Bubonic and septicemic plague generally originate from bites of infected fleas, while primary pneumonic plague is transmitted by droplet from man to man without an arthropod vector. Infection is transmitted from rat to rat and from rat to man by certain fleas (Xenopsylla cheopsi and others). It may occur through rubbing flea vomitus or feces containing bacilli into a bitten area. It may also result from handling infected rodents or tissue derived from them. Plague may be contracted from human cases through contact with the discharge from buboes or from the respiratory tract, or through the handling of infected tissues. Grain and cotton harboring infected fleas may be a means of spreading plague.

### Geographic Distribution

Plague is widely but unevenly disbursed in many endemic foci from which it may spread along lines of travel. The most important

geographic foci are India and China. The disease is also found throughout Southeastern Asia, Java, the northern end of the Caspian Sea, Iran, Syria, and adjacent parts of Turkey. The countries on the southern shore of the Mediterranean and French West Africa, though suffering until recently, are not apparently free of the human disease. The infection still plays a considerable role in parts of Madagascar and eastern and southern Africa and in parts of the northwestern, northern, and northeastern coast of South America, and south central South America. Occasionally, plague occurs in New Caledonia. Sylvatic infection with rare human cases is found throughout the western part of the United States, in certain areas of South Africa, and in Hawaii.

### Clinical Picture

The incubation period varies from 2 to 10 days and the severity of the disease is variable. Mild cases, often undetected, may serve as dangerous reservoirs of infection. As a rule, the onset is sudden with high fever and severe prostration. The pulse becomes rapid, feeble, and irregular after onset of clinical symptoms. Occasionally, superficial vesicles, petechiae, or purpuric spots appear on various parts of the body. Muscular incoordination and mental confusion are common. Delirium or coma may develop. The prognosis in untreated cases is serious; mortality ranges from less than 30% in uncomplicated bubonic plague in some epidemics to almost 100% in the pneumonic form. Prompt vigorous administration of specific antibiotics significantly lowers the mortality rates in the bubonic, septicemic and pneumonic forms. In the last two types, recovery is contingent upon initiation of appropriate specific therapy not later than 15-20 hours after the onset of illness. Bacteriemia is an outstanding feature of the septicemic form and is not uncommon in bubonic and pneumonic plague. Three types of human plague are distinguishable clinically.

Bubonic. Bubonic plague patients develop rapidly enlarging, painful lymph nodes in the areas draining the portal of entry. The degree of pain is variable. The skin and subcutaneous tissues surrounding the buboes are apt to become inflamed and edematous. The buboes may resolve but more often develop fluctuation as a result of suppuration. Spontaneous rupture with development of sinus tracts may occur. The average fatality rate in bubonic plague is 30%. Present chemotherapy almost invariably effects a cure if treatment is instituted early.

Septicemic. Septicemic plague is characterized by overwhelming toxicity and is rapidly fatal. There is moderate enlargement of the lymph nodes. Skin hemorrhages of varying extent are frequent. Since early



diagnosis is difficult, the prognosis is grave even in patients who receive specific therapy.

Pneumonic. Pneumonic plague cases are characterized by rapid onset with fever, toxicity, cough, thin or frothy jelly-like bloody expectoration, dyspnea and diffusely scattered rales. Lung consolidation may be recognized early by x-ray examinations. Recovery, while quite exceptional in untreated cases, ensues when energetic specific treatment is begun within the early hours of the disease.

### Diagnosis

It is important to recognize sporadic cases among inhabitants of endemic areas and seaports which provide frequent communication with recognized endemic areas. The diagnosis should be suspected on epidemiologic and clinical grounds. The diagnosis is confirmed as described below. (Warning: All infectious material must be handled with the greatest care.) All animals inoculated for plague diagnosis must be free of fleas and other ectoparasites prior to inoculation and thereafter be kept in insectproof cages in a separate room away from other animals. All persons handling smears, cultures, cages, or inoculated animals must wear gowns, rubber gloves, and masks, and must observe the strictest aseptic technique. Confirmation of the clinical diagnosis can be obtained by:

- 1 Smear of aspirated pus from a bubo or sputum fixed with ethyl alcohol and stained with methylene blue. Plague organisms are short with bipolar staining, and involution forms appear swollen and vacuolated.
- 2 Culture of bubo contents or blood on nutrient agar or in broth shows characteristic gram-negative organisms.
- 3 Inoculation of bubo juice, sputum, blood, or other material into guinea pigs or selected strains of white mice subcutaneously or intraperitoneally, or by skin scarification in guinea pigs, produces death within a few days. At autopsy of animal, characteristic lesions are found and Pasteurella pestis can be recovered.

### Treatment

Specific antibiotic therapy is vital and must be instituted immediately upon suspicion of the diagnosis of plague by the first medical officer who

sees the patient. Specific measures also must be taken immediately to free the patient of fleas and other vermin. If adequate specific therapy is administered early in the disease, the need for medical control of fluid and electrolyte balance to combat delirium and shock is considerably lessened, although the importance of good general medical care cannot be disregarded.

Streptomycin and the broad spectrum antibiotics are effective in all types of plague; penicillin is worthless. The following treatment is recommended: Initial intramuscular injection of 1 gm. of streptomycin followed by 0.5 gm. every 4 hours until the temperature remains normal for 4 or 5 days. Chloramphenicol, aureomycin, or terramycin may be used in the usual dosage of 2 to 4 gm. daily beginning with a loading dose, preferably by a parenteral route. In the pneumonic and the fulminating septicemic forms of the disease, therapy must be initiated within hours after onset if the patient is to survive. The use of sulfonamides in the treatment of plague probably has no place in military medicine. However, its use in indigenous populations with bubonic and septicemic plague for whom the Military must assume responsibility, is indicated when adequate supplies of the specific antibiotics are unavailable. When sulfonamides are employed 10 gm. of sulfadiazine are given during the first 24 hours and 4 gm. daily thereafter until the patient has been afebrile for several days.

Surgical treatment has no place in the early therapy of bubonic plague because incision of buboes at this stage may produce harmful spread of infection. When suppuration has developed and the usual indications for surgical drainage are present, this procedure may be undertaken under the general protection of therapeutic doses of specific antibiotics.

### Prevention

Patients should be kept in separate screened rooms and necessary attendants only should be allowed to enter the rooms. In pneumonic or suspected pneumonic cases, attendants must wear hoods with goggles or plastic eye openings, coveralls, or complete gown with trousers, and rubber gloves. All waste articles contaminated by discharges are to be burned. Bedding, linens, and utensils in contact with the patient should be sterilized by boiling or autoclaving. After a room is vacated, the walls, floor, and furniture should be disinfected by washing with a phenolic compound of sufficient bactericidal properties, and the room should be allowed to air for 48 hours. Persons handling the bodies of patients who have died from plague should observe strict aseptic precautions.

Personnel should be restricted from entering an area where an infection has been acquired until the danger is past. If a pneumonic case occurs, contacts and suspected contacts should be segregated and have



temperatures taken every 4 to 6 hours for 8 days. Any person developing fever should be isolated regardless of cause and full antibiotic therapy instituted immediately. Close association with segregated persons should be avoided. Inspecting personnel should wear gowns, coveralls, caps, masks, and rubber gloves.

Destruction of fleas in and near quarters, mess halls, latrines, storerooms, hospitals, and other buildings should coincide with rodent control programs. Rat harborages should receive special attention. Under special conditions the ground where large bodies of troops must operate for some time may also be treated with some of the newer insecticides in order to kill the flea vectors of plague. In each instance, insecticides with a long-term residual effect must be chosen. Although the duration of effect will vary from place to place, dieldrin and lindane insecticides are probably more effective for longer periods of time after application than DDT. These chemicals are toxic and are to be used only by trained personnel.

Dieldrin. Add one part of 18% emulsifiable concentrate (Federal Stock No. 6840-264-9043) to 29 parts of water (4.5 ounces per gallon of water). This makes a 0.6% dieldrin spray. Outdoors apply to ground litter and rodent runways and burrows at a rate of 10 to 20 gallons per acre, depending upon the amount of vegetative cover and litter. Indoors apply to floors and baseboards, especially about rat harborages. The 50% water-dispersible powder (Federal Stock No. 6840-281-2059) is equally effective at the rate of 1.5 ounce per gallon of water.

Lindane. (Gamma isomer of benzene hexachloride). Add one part of the 20% emulsion concentrate (Federal Stock No. 6840-242-4213) to 49 parts of water (2.6 ounces per gallon of water). Apply as in the case of dieldrin above. The 75% water-dispersible powder (Federal Stock No. 6840-227-1840) is equally effective at the rate of two-thirds of an ounce of insecticide to a gallon of water.

DDT. DDT is efficient as a residual insecticide for the control of fleas but dieldrin and lindane are preferable, if available, because of their longer lasting effectiveness.

In areas where plague is endemic, it is also essential that clothing be treated with a repellent chemical. All troops whose activities bring them into contact with ground that might harbor infected arthropods, should have their blankets or sleeping bag covers impregnated with the repellents which provide protection against a variety of arthropods. Impregnation may be accomplished by hand dipping of clothing by units in the field or by machine impregnation in laundry units. Dilution rates vary with the type of

repellent, method of impregnation, and type of uniform. Detailed instructions for impregnation of clothing should be obtained from current instructions and should be followed explicitly. Prolonged or excessive contact with repellent, particularly the concentrate, should be avoided during impregnation. Treated uniforms should not be worn until they are thoroughly dry, and untreated shorts should be worn to prevent skin irritation. Plastics such as watch crystals, fountain pens, and pocket combs are affected by contact with treated clothing or repellent.

Personnel in plague-infected areas should treat exposed portions of the skin with insect repellent especially designed for the purpose (Federal Stock No. 6840-00-19013). The repellent may be put on the arms and legs prior to entrance into such areas. Reapplication usually is necessary every 4 to 8 hours. In the event of an emergency, individuals may impregnate their clothing with this repellent by spraying it on uniforms by means of an insecticide sprayer. Ordinarily two and one-half ounces per uniform are required to give protection. Individual treatment of uniforms by this means is not as satisfactory as complete impregnation by the methods referred to above.

Care should be taken to avoid applying insect repellent (Federal Stock No. 6840-00-19013) to mucous membranes and similarly sensitive parts of the body. Repellents designed for clothing impregnation must not be applied directly to the skin. The spraying of the uniform does not protect the exposed skin. (Most insect repellents are solvents for some paints and plastics.)

Sleeping bags and bedding should be dusted with insecticide powder containing lindane (Federal Stock No. 6840-242-4217). In the event this is unavailable, DDT powder (Federal Stock No. 6840-242-4229) may be used.

The rat population in endemic areas should be closely watched, and any increase of rodent plague should be met by adequate control measures. All buildings and ships should be ratproofed. Rat extermination campaigns should be conducted by sanitary platoons or other trained personnel. Poisoning and fumigation are more effective than trapping for destruction of large numbers of rodents. Red squill and zinc phosphide are the poisons now commonly used for short-term campaigns. Sodium fluoroacetate (1080) is even more effective but should be used only when possibilities for the accidental poisoning of human beings and domestic animals can be rigidly excluded. Anticoagulants such as "Warfarin" give excellent results in the long run but have less initial impact than the aforementioned poisons. Cyanide, or carbon disulfide, are employed for fumigation but only specially trained personnel should apply these materials. Camps must not provide harborage for rats or permit access of rodents to food supplies. Special attention should be given to garbage collection and



disposal. When human plague is discovered, the extent of the disease in the rodent population should be determined by trapping in every direction from the focus of infection until no additional infected animals are found. Destruction of harborages and ratproofing measures, as well as extermination programs, should begin at the periphery and proceed toward the center of infection.

All Military personnel under serious threat of exposure to plague should be immunized with plague vaccine. (BuMedInst 6230.1). The initial vaccination consists of two subcutaneous injections of plague vaccine with an interval of 7 to 10 days between injections. The first dose is 0.5 cc. and the second dose is 1.0 cc. of vaccine. Additional 1.0 cc doses of plague vaccine may be administered whenever, in the opinion of the physician, additional stimulation of immunity is necessary.

### Sylvatic Plague

This term refers to flea-borne plague caused by *P. pestis* among wild rodents. Sylvatic plague occurs as an epizootic disease among ground squirrels, marmots, rabbits, and other rodents which do not ordinarily live in close association with man. This type of plague may be the source of sporadic human infections and may be introduced into the domestic rat population of cities, following which epidemics of rat plague and human plague may occur. Essential control measures involve: (1) avoidance of unnecessary contact with wild rodents, and (2) although difficult to attain, control of wild rodents and their fleas in the vicinity of human settlements and habitations

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### Penicillin Prophylaxis of Gonorrhea

BuMedInst 6222.3B of 25 October 1954 has been interpreted by many as prohibiting the use of oral penicillin for the prevention of gonorrhea. This interpretation is incorrect. Medical officers are at liberty to use this chemoprophylaxis as they desire and should not refuse it to those who request it only on the basis of this instruction.

For the reasons set forth in that instruction, major emphasis on the prevention of venereal diseases should not be focused on chemoprophylaxis, since oral penicillin has been shown to be effective only in the prevention of gonorrhea, whereas the real medical department problem is bound up with other venereal diseases.

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### Diphtheria in Our Time

The disastrous effects of the diphtheria epidemics that swept over the land during the past century are almost inconceivable to present generations. There have been long periods of quiescence followed by devastating pandemics. The last great pandemic ran from 1872 to 1876. Throughout the nineteenth century, diphtheria was a common cause of death in young children but it was confused with scarlet fever, septic sore throat, croup, and bronchitis and did not appear as a cause of death on death certificates until about 1850. Consequently, we cannot be certain about its exact prevalence until the end of the century.

In 1891, sera from immunized animals was first employed in the treatment of clinical diphtheria. The methods for controlling diphtheria in populations by mass immunizations developed logically from there. In 1909, Theobald Smith suggested, and in 1913, Behring demonstrated, that toxin neutralized by antitoxin would induce immunity safely in man. Park, in 1922, applied this on a large scale for the protection of children. And in the years since, active immunization with formalin-treated diphtheria toxin or toxoid has all but eliminated, where it is used, the incidence of diphtheria in small children. Recent studies have shown that nearly 40% of recruits have no immunity to diphtheria. In these times the most susceptible group, considering of course the influence of immunization procedures, is made up of the "preinduction" or "teen-age" group. The immunity resulting from their immunizations of childhood has waned, and lowering of the diphtheria incidence has reduced the opportunity to develop new natural immunity through exposure.

The more successful the campaign to stamp out diphtheria, the more certain it becomes that a susceptible adult population will develop if one depends on immunization only during infancy.

Since the first week in August of this year, there has been a marked increase in the number of cases of diphtheria reported in the United States. During the 6 weeks which ended with 10 September, there were 237 cases as compared with 156 for the same period of last year. Diphtheria is still a disease of public health (preventive medicine) importance. In a southern town of 375 inhabitants, 25 cases of the disease with one death occurred over a period of several months during the current year. In a northern state, 11 cases with 2 deaths occurred among 5 families. In another area there was an increase in cases in April. This increase appeared to be a continuation of a relatively high incidence during the autumn of 1954; 37 cases with 7 deaths occurred extending over both of these periods. The usual seasonal pattern of diphtheria is a rising incidence in the late summer in the South, and an autumnal rise in the North.

Although the naturally acquired immunization of adults and the Navy's immunization program have virtually eliminated diphtheria among adult



naval personnel, this disease is still present and, according to civilian morbidity and mortality reports, is on the increase again.

The new combined Tetanus and Diphtheria toxoids (FSN 6505-299-8296) which now will be used by the Armed Forces in place of plain alum precipitated tetanus toxoid in primary and booster immunization against tetanus, will, it is anticipated, after at least 2 injections, confer adequate protection against diphtheria in all persons over 14 years of age. It is expected that the routine use of this new combined toxoid will eventually eliminate the necessity of Schick testing as well as diphtheria toxoid for adult naval personnel. This new combined toxoid does not contain a sufficient amount of diphtheria toxoid to allow it to be used for the immunization of children against diphtheria. However, it does contain the full amount of tetanus toxoid and can be used for immunization against tetanus in any circumstance where plain tetanus toxoid has been used in the past.

Individual hypersensitivity to diphtheria toxoid is not a contraindication to immunization with the combined toxoids preparation and prior Schick testing is not required.

Infants born to immune mothers are immune from attacks of diphtheria for about 6 months, and immunity is usually lost completely by the ninth month of age. In most communities, it is slowly regained so that two-thirds of young adults will be found to be immune. This specific immunity has arisen probably from exposure to noninfectious doses of the organisms or to invasion with relatively avirulent strains. Today, most infants are immunized against diphtheria, pertussis, and tetanus with a combined alum precipitated toxoid.

There is a general impression that, coincident with the disappearance of diphtheria from many communities, there has occurred a corresponding disappearance of this organism and a marked diminution in its virulence. Such is not the case. There is every reason to believe that the diphtheria bacillus is just as great a potential danger as ever, and that it exists with sufficient prevalence to make relaxation of vigilance a danger to the community. The knowledge and tools appear to be at hand for eradicating diphtheria. A great deal has been accomplished but there are still unsolved difficulties and unknown facts which may thwart even the most active public health efforts. (John F. Egan, LT MC USN, PrevMedDiv, BuMed)

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#### Bacterial Contamination of Water Fountains

Much emphasis has been given to the safeguarding of potable water supplies from contamination, and on the whole, water supplies in most of the United States and at naval activities are maintained in a high state of purity.

Disease transmission via water is still possible, however, if the methods of use by the consumer are faulty. One recognized danger was the common water bucket and cup, and the sharing of a common drinking vessel has been outlawed in best public health practice. In most offices, aboard ships, and in other public gathering places, drinking fountains have been installed as the safest means for delivery of water to be used.

A recent study from Michigan State College has again demonstrated that drinking fountains are not without danger. A survey was made of fountains in public schools. Four types of fountain were studied; bubble, vertical jet, angle jet without an orifice guard, and angle jet with an orifice guard. In addition, four refrigerated angle jet drinking fountains were checked. Further, several types of fountain were subjected to testing under laboratory conditions. The results of these tests showed that all types of drinking fountains in ordinary use were rapidly contaminated by bacteria washed from the lips and mouths of the users. Nearly 100% showed contamination with streptococci of buccal origin. The bubble type of fountain was the greatest offender, followed by the angle jet without an orifice guard.

The results of these studies have confirmed the results of earlier workers regarding the general undesirability of bubble type drinking fountains for public use, and they recommend that this type of fountain be prohibited. (Mallmann, W. L., Fontes, A. K., Bacteriological Study of Drinking Fountains: J. Am. Waterworks Assoc., 47: 235-242, March 1955)

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